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HYPOCALCAEMIA IN GRAZING EWES IN RELATION TO PREGNANCY AND PARTURITION
(A CLINICAL REPORT)

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INTRODUCTION

Acute hypocalcaemia (HCa) affects ewes in late pregnancy or early lactation and up to 30% of the ewes in the affected flocks may develop the disease. Although the incidence of the disorder is generally low, the mortality rate in the affected animals tends to be high (up to 90%) unless treated, with deaths occurring in 4 hours to 3 days following the onset of the noticeable signs (Cleon, 1988) . The exact cause of severe HCa is complex and remains obscure despite the intensive investigations over the last half century. In ewes, the critical demand for Ca during the last 4-6 weeks of gestation, is a major participating factor in the failure of the normal homeostatic control of blood Ca (Sanson et al., 1982).

A significant decline in serum Ca (1/2 to 1/3 of the normal value) have been reported due to prolong dietary deficiency of Ca in pregnant or lactating ewes (Silva and Noakes, 1984). However, HCa may occur in spite of a plentiful supply of Ca in the diet, sheep and dairy cow are normally unable to absorb enough Ca to meet the peak requirements of pregnancy and lactation and Ca retention is usually negative at this time (Barithwaite, 1978a and Van't Kloaster, 1976). On the other hand, HCa may also occur when animals are stressed in late pregnancy or early lactation (Sanson et al., 1982), or given access to young green cereal crops and other oxalate-containing feeds (Silva and Noakes, 1984). In addition, fasting for 2-4 days, especially when combined with transport, severe driving (Hughes and kershaw, 1958) may lower serum Ca level. These stress factors increase norepinerhprine corticosteroid, which antagonizes vit. D increasing Ca loss in the urine and decreasing Ca mobilization from bone.

The signs of disease onset, generally are less dramatic and variable in sheep, when compared with cow. It showed a wobbly gait, constipation and/or weak labour at parturition, collapse and recumbency are less common (Cleon, 1988). However many aspects of the disease mechanism are yet poorly understood. Therefore, the present

field condition was undertaken to report the clinical symptoms, and studying the circumstances which lead to lambing disease in grazing ewes.

HISTORY OF THE FLOCK:

The present disease condition was observed in the early fall of 1991 in a flock of approximatelly 600 crossbreed ewes. The history revealed that animals were grazed for about 30 days on the stubbles and residues of corn, rice and cotton shrubs without additional grains or concentrates. However, the flock may occasionally transferred to graze on green darawa to compansate for the scanty of the pasture. The owner mentioned that, the flock was drivin for about 10 hours during which they covered about 18 km, then steped overnight in a holding field. At the following morning, the flock was moved for about 10 km to graze in a field of green darawa, they covered the distance during 4hs. At late afternoon, the owner observed that about 70 ewes were laying down and most of them were unable to get up. The remainder ewes were laying down and most of them were unable to get up. The remainder ewes were standing up and continued in grazing.

CLINICAL FINDINGS AND INVESTIGATIONS:

Clinical examination showed that about 55 ewes were still laying down, forty of them were severely depressed. About 80% of the affected ewes were pregnant on abdominal palpation. Ten out of the most severely affected ewes were examined more closely. Rectal temperature was 37-38.5C, respiration was rapid, pulse rate was accelerated (110-140/m) and heart beats were weak. The ewes were extremely depressed but the corneal reflex was still present and pupils were moderately dilated. There was a ruminal stasis with moderate bloat and excessive salivation. Antipartum vaginal prolapse of various degrees was observed in 14 out of the affected ewes. Upon vaginal examination, the cervix was either closed (8 cases) or opened 2-3 fingers, and the cervical seol was liquified (6 cases), their mammary glands were moderately hypraemic and contained colostrum, they were near parturition.

Urine samples were collected from the ten examined ewes, a field test for detection of ketones was carried using diagnostic strips (Medi-test Combi-9, Machery-Nagel F.R. and Germany), the results were negative. On excluding pregnancy toxaemia acute hypocalcaemia was suggested. A suggestive treatment and diagnostic ait was immediately tried, each of th ten ewes was SC. injected with 15 ml of 20% Ca borogluconate sol equaly distributed on both axillar spaces. In order to diagnose, bloo samples were collected from th examined ewes prior to Ca injec tion for determination of Ca, inor

ganic phosphorus (Pi) and magnesium (Mg) by the use of diagnostic test kits (BioMerieux, Bains, France).

RESPONSE FOR TREATMENT:

As the diagnos tictreatment with calcium gave a favorable to satisfactory response, all the affected ewes were treated. Each ewe was SC. injected with 100-150 ml Ca borogluconate sol. (based on body weight and severity). Thirty out of the 70 affected ewes were recovered and most of them were able to stand within 1-2 hours after injection. In order to enhance cervical dilatation or induce parturition, the prolapsed ewes were IV. injected with 20 ml estradiol benzoate (Folone-5, Misr Co., Cairo, ARE) and/or 20 I.U. oxytocin (Oxytocine synth; Ciba-Geigy Ltd, Basle, Switzerland) in 150 ml Ca borogluconate solution. Determination of serum Ca, Pi and Mg levels revealed a marked decrease in Ca with low level of Pi. Two ewes had Mg level above the normal range and the Ca:Mg ratio was markedly reduced in all cases (Table 1).

On a return visit, in the next morning, approximately one third of the treated ewes were still laying down. Additionally 7 more ewes get affected. As Ca deficiency was confirmed all the downer ewes were SC. injected with a second dose of Ca borogluconate. Most of the affected ewes recovered by the afternoon. The prolapsed ewes that received estradiol benzoate and/or oxytoxin on the day before were lambed (4 twins and 2 single) 4-6 hours post injection. Cervical dilatation was observed in 3 out of the 8 cases which were injected with estradiol benzoate. These were injected with 20 I.U. oxytocin in 100 ml Ca borogluconate through IV. drip technique to enhance parturition. The remainder five ewes were further administered with 20 mg estradiol benzoate in Ca solution to help cervical dilatation. On the next day, it was found that the cervix still closed in 3 out of 5 ewes in spite of double injections with 20 mg estradiol. In order to help those ewes to get up, cesarean sections was performed through the ventral abdominal wall between the linea alba and the subcutaneous abdominal vein following liner infeltration of procain hydrochloride 2% sol. Two of them were recovered with twins, while the third was slaughtered. That ewe was frustrated propably due to aspiration of copious saliva and mucous in the mouth during operation.

The owner was instructed to start feeding hay and providing bone meal in ground corn to be fed at 1/2 kg head/day for pregnant ewes a month prior to lambing unless when fed on good-quality pasture. On a recheck visit two days later new cases were not observed in the flock.

DISCUSSION

In the case reported herein, the

Table (1): Serum calcium ,inorganic phosphorus(Pi) and magnesium levels(mg/dl) of the different ewes.

Case No.	Ca	Pi	Mg	Ca:Mg
1	4.5	3.8	3.1	1.36
2	5.2	4.2	3.2	1.63
3	6.1	3.8	1.9	3.20
4	3.8	3.5	2.4	1.58
5	6.2	3.7	2.5	2.48
6	5.3	4.1	2.2	2.41
7	4.4	4.1	2.4	1.83
8	3.9	4.5	2.9	1.34
9	3.8	3.9	2.5	1.52
10	4.3	5.0	2.4	1.79
Mean	4.75	4.06	2.55	1.91
±Sd	0.90	0.44	0.40	—
Normal level	9-12	4 9	1.8 3.2	4.2

Table (2): Distribution of ewes under investigation.

Item	No.	Item	No.
Total No. of flock	600	Ewes had closed cervix	8
Affected ewes	77	Ewes had opened cervix	6
Severely depressed	40	Hormonally treated ewes	14
Affected pregnant ewes	50	Ewes respond to H. treat	11
Ewes showed antipartum vaginal prolapse	14	Surgical treated ewes	3
		Slughtered after operation	1

history of the flock and the clinical signs were suggestive of hypocalceamia, the response to parenteral Ca therapy was indicative and the diagnosis was further confirmed by blood analysis for Ca, Pi and Mg. Serum Ca level fail to 4.75 mg/dl. The results also showed that HCa was acconpanied by hypophosphataemia. Similar findings were reported by Daniel and Moodie (1979) and Orma (1984) in experimentally induced HCa, through i.V. injection of Na, EDTA, in sheep. The Ca:Mg ratio of the affected ewes decreased from a normal value of 6:1 to about 2:1 (Table 1). At this ratio Mg narcosis occurs and signs of depression will observed as reported early by Bowen et al. (1970).

The circumstances of the present condition of acute hypocalcaemia are prolonged grazing on poor quality stubbles of low and less available Ca and protein content followed by severe driving to a

new quarter. Also, most of the affected ewes were pregnant (80%). **Sykes and Field (1972)** proposed that the considerable losses in skeletal Ca content of the hill sheep that frequently occur during pregnancy is a result of inadequate protein intake rather than inadequate Ca intake. Low Ca absorption and retention rates in sheep fed low-protein diet had been reported by **Barithwaite (1978) and Orma (1984)**. Also, it has been concluded that Ca regulatroy system of sheep appears to be slow and delays for about 2 days to do its function and this may contribute to development of HCa **(Orma 1984)**.

Althought most forages and rouphages secure the lower limit of Ca needed by sheep. (0.21-0.27% of dry matter fed for pregnant ewes according to the NRC, 1984). **Braithwaite (1978b)** stated that Ca from straw may be lightly bound. Also, **Perdome et al. (1977)** reported that Ca absorption by sheep tended to decline with maturity of the forages. Also, **Orma (1984)** recorded that stimulation of Ca absorption in sheep by incuced HCa fail to increase the low absorption rate of Ca supplied from wheat straw.

Antipartum vaginal prolapse was observed in 14 cases with either closed or incompletely opened cervix. Similar observation was cited by **Cleon (1988)** who stated that poor uterine lone associated with HCa has been correlated with cervico-vaginal prolapse and incomplete or non-dilation of the cervix. Although treatment of vaginal prolapse by valvar sutures either by mattress or purse-string type of suture is practically possible, application of such method was not recommended especially on field condition of large number as the case reported here, especially near parturition. Therefore induction of parturition was tried through injection of 20 mg estradiol benzoate and/or I.U. oxytocin according to the degree of cervical dilatation. Similar procedure was adopted by **Cahill et al. (1976)**. They induced parturition in ewes at 142-148 days of gestation with single injection of 20mg estradiol benzoate. Whereas, **Harman and Styler (1980)** induced parturition in ewes with either 2mg flumethasone or 15mg prostaglandin F2 on day 141 of gestation.

The prolapsed ewes (3 cases) which fail to respond for hormonal treatment were surgically treated through cesarean section. Similar indications were reported by **Roberts (1986)**. Cesarean section was performed in the ventral abdominal wall after **Ellis (1958)**.

In general, from this field study it could be concluded that severe acute hypocalcaemia may affect ewes grazing on poor-pastures. Late pregnancy, severe driving, low calcium and/or protein content in addition to the slow-delayed Ca regulatory system of sheep are participating factors. Hormonal and/or surgical treatment in addition to Ca

therapy are successful means to enhance parturition and help weak labour in affected ewes. However, proper nutrition to meet the high needs at late pregnancy and supplementation of grains a month prior to parturition may help to control the disease.

SUMMARY

Acute hypocalcaemia (HCa) was diagnosed in 77 out of 600 ewes grazed on stubbles of corn, rice and cotton shrubs for about 30 days, with no additional grains or concentrates. Affected ewes were severely depressed with excessive salivation, ruminal stasis and bloat. Antipartum vaginal prolapse of various degrees and weak labour were observed in 14 affected ewes. The propable cause and the results of hormonal and/or surgical treatment in addition to Ca therapy were discussed.

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